REMARKS

Claims 1-12 are pending in the application.

35 U.S.C. § 103 REJECTIONS

In the present Office Action, claims 1-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Bodell (U.S. Patent No. 4,768,186). Applicant respectfully traverses these rejections and requests reconsideration in view of the following discussion.

Applicant submits that claim 1 recites features that are neither disclosed nor suggested by the cited art. For example, in paragraph 3 of the present Office Action, the examiner states that:

> "Bodell appears to suggest estimating the attenuation of the communication system via a pilot carrier signal for monitoring, adjustment, and alarm purposes (column 2 lines 43-49). Furthermore, Bodell teaches that the powers of certain frequencies are improved, thereby compensating for losses experienced by certain frequencies (column 6 lines 1-23). One skilled in the art would have been motivated to estimate the attenuation of the communications system for each of the low-speed channels in order to compensate for the attenuation presented to certain channels as suggested by Bodell. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to estimate the attenuation of the communications system for each low-speed channels and compensate for the estimated attenuation of the communications system via adjustment of the power of each low-speed channel."

However, claim 1 recites a method which includes:

> "for each low-speed channel, estimating attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel."

Applicant submits that the recited features differ in a number of significant ways from anything suggested by Bodell and that therefore, it would not have been obvious to one skilled in the art at the time the invention was made to modify the teachings of Bodell with the claimed limitations.

First, it is noted that Bodell discloses means for adjusting the emphasis of different frequencies via a preemphasizer that is paired with a deemphasizer. More specifically, Bodell recites

> "As a further means for improving the quality of signal transmission, a preemphasizer 55 and 55a may be included intermediate the source of amplitude modulated, multiplexed signals, such as the master group multiplexer 6, and the FM modulator 7 and 7a for emphasizing certain frequencies and thereby improving the power transmitted at such frequencies and hence, the signal-to-noise ratio. Of course, when such a preemphasizer, 55 and 55a, is used, the signals are subjected to deemphasis at the receiving end, such as by the deemphasizers 56 and 56a.
>
> A typical preemphasis graph for the frequency range from 123.56 KHz to 6178 KHz is illustrated in FIG. 5. **The deemphasis graph would be the inverse of what is shown in FIG. 5.**" (Bodell, column 6, lines 1-15, emphasis added).

It is noted that the deemphasizer removes the emphasis introduced by the preemphasizer, since the deemphasizer follows a graph that is the inverse of that of the emphasizer. Consequently, any other sources of emphasis or deemphasis (such as dispersion) are not compensated. In effect, Bodell teaches away from compensating for attenuation caused by dispersion since such attenuation would cause Bodell's emphasizer and deemphasizer to be mis-matched. Therefore, Bodell does not suggest, and it would not have been obvious to one skilled in the art at the time the invention was made to estimate attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel since the paired emphasizer-deemphasizer is not suitable for compensating for such attenuation. Rather, Bodell's paired emphasizer-deemphasizer is generally directed to improving the signal-to-noise ratio. For example, if a given frequency is subject to a higher noise level

during transmission than other frequencies, preemphasizing the given frequency prior to transmission and deemphasizing it after transmission may improve the signal-to-noise ratio of the given frequency in a manner analogous to Dolby noise reduction in an audio system. Compensating for noise is entirely different from compensating for attenuation.

Secondly, even if, for the sake of argument, it is assumed that one skilled in the art at the time the invention was made would be motivated to estimate attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel, Bodell's pilot carrier signal is not suitable for doing so. Applicant finds no teaching or suggestion in Bodell that the pilot carrier signal comprises signals at more than one frequency. The term "pilot carrier signal" suggests a signal transmitted on a particular carrier frequency. In order to estimate certain types of dispersion that may vary among each of the low-speed channels using the pilot carrier signal (e.g., chromatic dispersion), the pilot carrier signal would have to be able to separately measure attenuation at each of the frequency bands allocated for each low-speed channel. Such estimation is neither taught nor suggested by Bodell's pilot carrier signal. Rather Bodell teaches that the pilot carrier signal is used

> "for monitoring purposes, e.g. to indicate whether a multiplexer is not functioning or no modulating signals are being processed." (Bodell, column 3, lines 33-35).

Bodell also teaches that:

> "Pilot tone signal information of the detector-demodulator 29 is supplied to an automatic gain control driver 30 which, as indicated schematically by the variable resistors 31, 32 and 33, controls the gain through the amplifiers 21-23 in accordance with the amplitude of the pilot tone signal." (Bodell, column 4, lines 32-37).

However, this teaching refers to controlling the overall gain of all channels collectively, rather than to the relative gain between channels. Therefore, Applicant submits that one skilled in the art at the time the invention was made would not be motivated to estimate attenuation caused by dispersion resulting from transmission of the low-speed channel

across the optical fiber in the frequency band allocated to the low-speed channel using Bodell's pilot carrier signal.

In summary, Applicant finds no teaching or suggestion in Bodell of, for each low-speed channel, estimating attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel. Accordingly, Applicant submits that claim 1 is patentably distinguishable from the cited art for at least the above reasons. As independent claim 7 includes limitations similar to those of claim 1, claim 7 is believed patentably distinguishable from the cited art for similar reasons. Likewise, each of dependent claims 2-6 and 8-12 are believed patentably distinguishable from the cited art for at least the above reasons as well.

In addition to the above, Applicant submits the dependent claims recite additional features which are neither taught nor suggested by the cited art. For example, Applicant submits that claims 2 and 8 recite limitations neither taught nor suggested by the cited art. On page 3, paragraph 2 of the present Office Action, the examiner states that

> "Regarding claims 2 and 8, Bodell differs from the claimed invention in that Bodell fails to specifically teach that the step of adjusting a power of each low-speed channel comprises applying a gain to each low-speed channel which is equal in magnitude to the estimated attenuation for that low-speed channel. One skilled in the art would clearly have recognized that in order to compensate for the attenuation experienced by the low-speed channels one would have matched the gain applied to the low speed channels with the magnitude of the estimated attenuation, thereby nulling the attenuation levels. One skilled in the art would have been motivated to match the gain and attenuation levels in order to fully compensate the low speed channels for the estimated attenuation of the system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to adjust the power of each low-speed channel by applying a gain to each low-speed channel, which is equal in magnitude to the estimated attenuation for that low-speed channel."

However, Applicant submits that as stated above, one skilled in the art at the time the invention was made would not have been motivated to estimate attenuation caused by

dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel by the teachings of Bodell. For example, since Bodell's paired emphasizer-deemphasizer is not suitable for compensating for attenuation within each channel, Bodell's teachings do not suggest applying a gain to each low-speed channel which is equal in magnitude to the estimated attenuation for that low-speed channel. Furthermore, since, as noted above, Bodell's pilot carrier signal is not suitable to estimate, for each channel, attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel, Bodell neither teaches nor suggests estimating the attenuation of each channel. Accordingly, without a teaching or motivation for estimating the attenuation of each low-speed channel, Applicant submits there is no teaching or suggestion in Bodell of applying a gain to each low-speed channel which is equal in magnitude to the estimated attenuation for that low-speed channel. Applicant submits that claims 2 and 8 are patentably distinguishable from the cited art for at least these additional reasons as well. Likewise, each of dependent claims 3 and 9 are believed patentably distinguishable from the cited art for at least the above reasons as well.

In addition to the above, Applicant submits that claims 5 and 11 recite further limitations neither taught nor suggested by the cited art. On page 4, paragraph 4 of the present Office Action, the examiner states that

> "Regarding claims 5, 6, 11, and 12 Bodell differs from the claimed invention in that Bodell fails specifically to teach that the step of estimating a gain for propagation through the optical fiber comprises estimating a gain due to chromatic dispersion or polarization mode dispersion for the frequency band allocated to the low-speed channel. However, since the system of Bodell propagates a pilot signal which monitors the various characteristics of the transmission system and makes adjustments based on the measurements (column 2 lines 42-49), one skilled in the art clearly would have recognized that gain due to chromatic dispersion and polarization mode dispersion would have also been measured by the pilot signal, and power measurements made based on the measurements. Furthermore, Bodell's main objective in propagating the pilot signal is to improve the quality of the signal transmission via adjustments made to certain frequencies based on monitoring results. One skilled in the art would have been motivated to measure chromatic

> dispersion or polarization mode dispersion for the frequency band allocated to the low-speed channel in order to improve the quality of signal transmission. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to measure the chromatic dispersion or polarization mode dispersion for the frequency band allocated to the low-speed channel in order to estimate the gain of the communication system."

However, as noted above, Bodell's pilot carrier signal is not suitable to estimate, for each channel, attenuation caused by dispersion resulting from transmission of the low-speed channel across the optical fiber in the frequency band allocated to the low-speed channel. In particular, Bodell's pilot carrier signal is not suitable to estimate chromatic dispersion since chromatic dispersion inherently varies from frequency to frequency and Bodell fails to teach that the pilot carrier signal comprises signals at more than one frequency. Accordingly, Applicant finds no teaching or suggestion in Bodell of estimating the attenuation caused by chromatic dispersion. Applicant submits that claims 5 and 11 are patentably distinguishable from the cited art for at least these additional reasons as well.

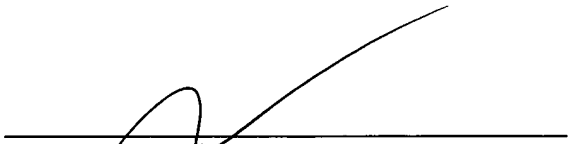
Applicant believes all claims to be in condition for allowance. Should the examiner believe issues remain which would prevent the application from proceeding to allowance, the below signed representative request a telephone interview (512) 853-8866 in order to facilitate a speedy resolution.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5957-41409/RDR.

Respectfully submitted,



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